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3,4-Methylenedioxymethamphetamine

National Cancer Institute

Source

National Cancer Institute. *3,4-Methylenedioxymethamphetamine*. NCI Thesaurus. Code C61081.

A ring-substituted amphetamine derivative, structurally related to the hallucinogen mescaline, with entactogenic, neurotoxic, and motor-stimulatory activities. 3,4-methylenedioxymethamphetamine (MDMA) produces an acute, rapid enhancement in both the release of serotonin from and the inhibition of serotonin reuptake by serotonergic nerve endings in the brain. Once within the cell, MDMA depletes stores of tryptophan hydroxylase (TPH) via acute oxidative inactivation; in turn, depleted stores of TPH leave cell terminals open to damage from oxidative stress, possibly a source of MDMA neurotoxicity. This agent also induces norepinephrine, dopamine, and acetylcholine release and can act directly on a number of receptors, including alpha 2-adrenergic and 5-hydroxytryptamine (5-HT) 2A receptors. MDMA may suppress the dyskinesia associated with long-term use of L-dopamine (L-DOPA) without affecting the efficacy of L-DOPA treatment.